

654

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project

Date

Author

TITLE

REPORT OF PINE BEETLE SURVEYS

on the

YAKIMA INDIAN RESERVATION, WASHINGTON

Season of 1946

By

John M. Whiteside

Forest Insect Laboratory
445 U. S. Court House
Portland 5, Oregon
February 10, 1947

SUBJECT--

INDEX NO.

REPORT OF PINE BEETLE SURVEYS
on the
YAKIMA INDIAN RESERVATION, WASHINGTON
Season of 1946

Approved by:

F. P. Keen
Entomologist, In Charge

Submitted by:

John M. Whiteside
Entomologist

Forest Insect Laboratory
445 U. S. Court House
Portland 5, Oregon
February 10, 1947

TABLE OF CONTENTS

	Page
SUMMARY OF RESULTS.....	
INTRODUCTION.....	1
RESULTS OF THE 1946 SURVEY.....	1
Losses on Virgin Stands.....	1
Losses on Cutover Stands.....	2
Losses on the Reservation as a Whole.....	3
GENERAL TREND OF PINE BEETLE LOSSES.....	3
RECOMMENDATIONS.....	4

Table 1. Results of the 1946 Survey - Ponderosa Pine
Timber Killed by Insects on 320-Acre Check Plots

Figure 1. Average Board Foot Per Acre Losses, 1937 - 1946

SUMMARY OF RESULTS

1945 Losses (Complete records)

Primary Insect: Western pine beetle in ponderosa pine

Estimated Gross Mortality for 1945:

<u>No. of Trees</u>	<u>Volume (Bd. Ft.)</u>	<u>Board Feet Per Acre</u>	<u>Percent of Stand</u>
20,000	17,000,000	45	0.5

Trend: Slightly lower than 1944

Classification: Normal endemic infestation

1946 Losses (Incomplete records)

Primary Insect: Same

Probable Trend: Upward from the level of 1945; probably about 57 percent higher

Recommendations: No direct control necessary but consideration of other sanitation-salvage operations advisable.

REPORT OF PINE BEETLE SURVEYS

on the

YAKIMA INDIAN RESERVATION, WASHINGTON

Season of 1946

INTRODUCTION

The annual cooperative surveys to follow the trend of pine beetle infestations in the ponderosa pine stands of the Yakima Indian Reservation and to determine the need for direct control work were completed during the period October 7 - 11, 1946. The field work, which was again limited to a 100 percent recruise of five 320-acre check plots in virgin stands (Table 1) and one 280-acre cutover plot in the Dry Creek Sale Area, was completed by a three-man crew composed of C. E. Chester and Stanley Johnson of the Indian Service and the writer. Mr. Chester also compiled the data for Table 1. The costs of the 1946 survey, except for the salary and expenses of the writer, were carried by the Indian Service.

RESULTS OF THE 1946 SURVEY

The 1946 survey completed the loss records for 1945 and gathered partial data on the 1946 pine beetle infestation. Once again the western pine beetle (Dendroctonus brevicornis Lec.) was found to be responsible for the death of most of the trees marked on the check plots. A few trees were killed by the mountain pine beetle (De.Monticolae Hopk.) or by species of Ips or Melanophila.

Losses on Virgin Stands

As shown in Table 1, there was considerable variation in the mortality on the five virgin plots in 1945. The gross losses for that year ranged from 2 to 116 board feet per acre or 0.02 to 1.10 percent of the stand with an average of 58 board feet per acre or 0.63 percent of the stand. The highest mortality was found on the Logy Creek plot (which has consistently shown high losses) and on the Castile Crossing plot. The lowest losses were found in the mixed pine and fir stand of the Olney Corral plot. Except for the moderate epidemic infestation on and adjacent to the Logy Creek plot, the 1945 losses represent a normal condition largely offset by annual growth in the younger age classes.

At the time of the survey, approximately 69 percent of the probable 1946 losses were evident. The 1946 infestation on the check plots has been estimated to be nearly 57 percent higher than that of the previous year. As in 1945, the Logy Creek and the Castile Crossing plots showed the heaviest losses with the three remaining plots having normal endemic infestations.

Losses on Cutover Stands

The record of ponderosa pine insect-caused mortality on the recently completed Dry Creek Sale Area is limited at the present time to the data obtained from the 280 acre Smith Springs plot (Table 1). This plot was cutover on a sanitation-salvage basis in 1944 and is being cruised to provide one check on the trend of pine beetle losses on this reservation following this type of cutting. Other plots should and will be established in this sale area.

As shown in Table 1, there were 7 trees with a total of 3,090 board feet killed on the Smith Springs plot in 1945 - the first year following cutting. Up to the time of the survey, there has been an additional 5 trees and 2,960 board feet killed in 1946. The total 1946 loss will probably equal 7 trees and 4,000 board feet. Considering the losses of 1944 (the year prior to cutting) as a base, it is evident that there has been a reduction in pine beetle losses following cutting of 87.4% in 1945 and a probable reduction of 83.7% in 1946.

An examination of the field sheets shows that part of the losses following cutting on the Smith Springs plot were in unmerchantable trees, which, in all probability would have been killed under virgin stand conditions, and that part of the losses were in merchantable trees that might have been removed by logging. In the following summary, all trees killed in 1945 and to date in 1946 on this plot have been classified according to merchantability:

Merchantable Trees

Marked and Uncut

2 trees = 1,790 bd. ft.; average 24" DBH and 890 bd. ft. / tree

Unmarked

6 trees = 3,650 bd. ft.; average 24" DBH and 610 bd. ft. / tree

Unmerchantable Trees

4 trees = 610 bd. ft. ; average 14" DBH and 150 bd. ft. / tree

Thus, of the 12 trees that have been killed by pine beetles since logging on the Smith Springs plot, 8 were merchantable and might have been included in the operation; however, as the above data indicate these 8 trees were of small diameter and contained an average of only 680 board feet per tree. For this operation, trees of this size might well be marginal trees.

It is the opinion of the writer that the results so far obtained by this type of cutting on the Yakima Indian Reservation indicate that a very satisfactory control of pine beetle losses has been achieved and that other sanitation-salvage operations are fully justified in the stands now showing high losses.

Losses on the Reservation as a Whole

Estimates of gross insect-caused losses in the ponderosa pine stands of the Yakima Indian Reservation as a whole for 1945, based primarily on the data obtained from the check plot surveys, have been placed at 20,000 trees and 17,000,000 board feet. Over most of the reservation these losses have probably been balanced by growth.

GENERAL TREND OF PINE BEETLE LOSSES

The trend of pine beetle losses on the check plots of the Yakima Indian Reservation during the period 1937 to 1946 is shown in Figure 1. The average board foot per acre per year loss on all check plots cruised during each survey was used as the basis for this chart. From a low in 1937, pine beetle losses increased each year until 1943 when a sharp drop occurred. Since 1943, the trend has been generally upward.

It is believed that the drop in pine beetle losses after 1942 was due to the combination of greatly improved growing conditions during 1943, 1944 and 1945 and to the low winter temperatures which occurred in January 1943 and which must have caused considerable mortality to the overwintering larvae. According to the records of the Weather Bureau, the minimum temperature for the State in 1943 was -33 degrees F., recorded on January 18 at the Stockhill Ranch in Okanogan County. The records state that, "Six Januaries have averaged colder since 1890 than January 1943 but only three times has a minimum lower than 33 degrees below zero been registered. All stations in eastern Washington recorded zero or below with the severest cold beginning on the 16th and continuing for about nine days." Although there are no official all-year weather stations in the timbered sections of the reservation, the records from the following adjacent stations are of interest:

<u>Station</u>	<u>Minimum Temperature</u>	<u>Date</u>
Mt. Adams Ranger Station	- 21	January 18, 1943
Goldendale	- 14	" " "
White Swan	- 12	" " "
Wapato	- 11	" " "

The record at Goldendale (which is the only available daily summary close to the reservation) shows that on January 17 the minimum air temperature was -3 degrees with a maximum of +10 degrees and a minimum of -14 degrees on January 18. From these records it is evident that lethal temperatures probably occurred during this cold spell to materially reduce pine beetle populations on the reservation. However, as shown in Figure 1, the benefit of this reduction was not lasting because the trend turned upward again in 1944.

RECOMMENDATIONS

In spite of the rather sharp rise in pine beetle losses estimated for 1946, direct control measures do not appear necessary. As has been recommended in previous reports, the extension of sanitation-salvage operations to other stands on the reservation would aid in reducing pine beetle losses as well as utilizing present values in trees highly susceptible to insect attack.

Table 1. Results of the 1946 Survey on the Yakima Indian Reservation. Ponderosa Pine Timber Killed by Insects on 320-Acre Check Plots

Check Plots					1945 Losses			
Name & Location	No.	Acres	Pine Volume	No. Trees	Gross Volume (BM)			Ratio to 1944
					Total	Per Acre	% of	
Trout Creek T7N, R13E, Sec.17W/2	4	320	1,900	21	9,160	29	.48	1.15
So. Cedar Valley T6N, R14E, Sec.9W/2	6	320	2,200	16	13,070	41	.59	1.28
Castile Crossing T9N, R12E, Sec.13W/2	12	320	5,200	36	37,200	116	.72	1.16
Logy Creek T7N, R16E, Sec.10W/2	14	320	3,000	48	33,080	103	1.10	.84
Olney Corral T10N, R14E, Sec.27W/2	16	300	2,500	4	580	2	.02	.09
Total 5 Virgin Plots		1,580	14,800	125	93,090	58	.63	.97
Average Per Plot		315	3,000	25	18,620	58	.63	.97
Cutover Plot Smith Springs T8N, R15E, Sec./2E/2	15	280	*	7	3,090	11	*	.12

* This plot has not been cruised since cutting; hence no volume or percent of stand figures.

FIGURE 1. AVERAGE BOARD FOOT PER ACRE LOSSES ON PINE BEETLE SURVEY CHECK PLOTS
ON THE YAKIMA INDIAN RESERVATION, 1937 - 1946

